

### Abstract

This invention relates to a multiphase reactor which is especially suitable for desulfurization of flue gas. A rotary build-in member comprising an axisymmetric body and an annular axisymmetric body is fixed on the shell of the reactor. The shell is cylindrical, and its surface is smooth or waved. The maximum diameter of the axisymmetric body is no less than the inner diameter of the annular axisymmetric body. The axisymmetric body is installed on the annular axisymmetric body coaxially. One rotary build-in member and its corresponding shell constitute an unit, and the reactor may have one or more such units. The multiphase reactor can effectively improve the flow pattern of the fluid and the contact of gas-liquid-solid three-phase of the reactants, speed up the mass transfer, and prevent deposition of the solid phase. The reactor is simple in structure and convenient for use. It can be used in the fields such as environmental protection, chemical engineering, metallurgy, and architectural industries.